

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the present application.

1. (currently amended) An isolated bacterial heme binding protein wherein said protein reversibly binds oxygen with a low affinity and wherein ~~said~~ a heme binding domain of said protein shows at least 20% identity to a myoglobin heme binding domain having an amino acid sequence of SEQ ID NO:76.

2. (original) The isolated heme-binding protein according to claim 1, wherein the protein comprises a heme binding domain and a signaling domain.

3. (original) The isolated heme-binding protein according to claim 1, wherein the protein is isolated from *Archaea*.

4. (currently amended) The isolated heme-binding protein according to claim 3, wherein the protein is isolated from *Halobacterium* *salinarium* ~~*salinarum*~~.

5. (original) The isolated heme-binding protein according to claim 4, wherein the protein's activity is salt tolerant.

6. (currently amended) The isolated heme-binding protein according to claim 1, wherein the protein has an amino acid sequence of ~~SEQ ID No.~~ SEQ ID NO:2.

7-10 (canceled)

11. (currently amended) A blood substitute comprising:
a bacterial heme binding protein wherein said protein reversibly binds oxygen with a low affinity and comprises a heme binding domain that shows at least 20% identity to a myoglobin heme binding domain having an amino acid sequence of SEQ ID NO:76.

12. (currently amended) The blood substitute according to claim ~~9~~ 11, wherein the protein comprises a heme binding domain and a signaling domain.

13. (currently amended) The blood substitute according to claim ~~10~~ 12, wherein the protein is isolated from *Archaea*.

14. (currently amended) The blood substitute according to claim ~~11~~ 13, wherein the protein is isolated from *Halobacterium salinarum* ~~salinarum~~.

15. (currently amended) The blood substitute according to claim ~~12~~ 14, wherein the protein's activity is salt tolerant.

16. (currently amended) The blood substitute according to claim ~~9~~ 11, wherein the protein has an amino acid sequence of ~~SEQ. ID. No.~~ SEQ ID NO:2.

17-47 (canceled)

48. (original) A chimeric protein comprising:
a heme-binding domain of an isolated heme binding bacterial protein; and
a heterologous signaling domain.

49. (currently amended) The chimeric protein according to claim ~~46~~ 48, wherein the heterologous signaling domain is a mutated signaling domain having altered affinity for its ligand.

50. (canceled)

51. (currently amended) The ~~chimeric isolated heme-binding~~ protein according to claim ~~47~~ 48, wherein the heme binding domain is from a heme binding protein ~~is~~ isolated from *Archaea*.

52. (currently amended) The ~~chimeric isolated heme-binding~~ protein according to claim ~~49~~ 51, wherein the heme binding protein is isolated from *Halobacterium salinarium salinarum*.

53. (currently amended) The ~~chimeric isolated heme-binding~~ protein according to claim ~~50~~ 52, wherein the ~~protein's~~ activity of the heme binding protein is salt tolerant.

54. (currently amended) The ~~chimeric isolated heme-binding~~ protein according to claim ~~51~~ 53, wherein the protein has an amino acid sequence of ~~SEQ ID No. SEQ ID NO:2~~.

55-63 (canceled)

64. (previously presented) A fragment of the isolated heme-binding protein according to claim 1, wherein said fragment comprises a heme-binding domain.

65. (currently amended) The fragment according to claim ~~4~~ 64, further comprising a heterologous signal transduction domain.

66. (new) The isolated heme-binding protein according to claim 1 wherein the protein is purified.

67. (new) The isolated heme-binding protein according to claim 1 wherein the protein is recombinant.